SASKATCHEWAN POLYTECHNIC

saskpolytech.ca

Microcontrollers

High School Workshop

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Health and Safety

Health, Safety & Security (sharepoint.com)

Incident Reporting

saskpoly.corepointinc.com/DefaultSite.aspx?menuid=6&siteid=26

Emergency Procedures

HR-17-017_EmergencyProceduresPoster_MOOSEJAW.pdf (saskpolytech.ca)

Alertus

Emergency Notification System (ENS)

Fire

When you hear the fire alarm:

- Immediately proceed to the nearest available fire exit in a calm orderly fashion.
- Close the doors if you are the last person out.
- Do not use the elevators.
- In the event you are unable to use the stairs due to a disability, proceed to the nearest stairwell and take temporary shelter, tell someone where you are.
- Follow the instructions for the emergency wardens (orange vests) or Campus Safety & Security
- Proceed to nearest assembly point.
- Do not re-enter the building until the emergency warden or Campus Safety & Security advises that it is safe to do so.

Sask Polytech

If you notice fire or smoke:

- Alert others to the danger as you leave; close the door to the room or area involved.
- Activate the nearest fire alarm.
- Immediately proceed to the nearest available fire exit in a calm orderly fashion.
- As soon as you can do so safely, call 911 (9-911 from a Sask Polytech phone).
- Tell Campus Safety and Security details of the fire. Stay nearby in case the Fire Department has additional questions.

Fire

Assembly Points

Below are photos of Sask Polytech assembly point signs. Each Campus has assembly points labeled A, B, C, D, etc. located around the perimeters of the campus footprint. Please take the time to familiarize yourself with your emergency escape route and what assembly point is closest to your location so you know where to assemble and direct your students during an evacuation.

Note: In some Sask Polytech locations, the assembly point will be specific to the building. Take the time to understand your emergency escape route and where you need to assemble during an evacuation.

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Medical Emergency

- Call 911 (9-911 from a Sask Polytech Phone)
- Call Campus Safety & Security at your location
- Inform them that you have called 911
- Describe the exact location of the emergency.
- Provide any assistance you can.

Campus Safety & Security

- Moose Jaw Campus: 306-691-8300
- Prince Albert Campus: 306-960-3995
- Regina Campus: 306-775-7777
- Saskatoon Campus: 306-659-4444

***Note: Health Nurses are not staffed to respond to emergencies. Follow the procedure as above if someone needs emergency medical care.**

***Note: All students who have opted into the Saskatchewan Polytechnic Student Association myStudentPlan - Extended Health and Dental Coverage have insurance which covers the cost of emergency transportation to a medical facility.**

Who am I?

Let’s start off with a fun demo!

The *key* to Cyber Attacks is to exploit **TRUST**.

Thus, the *key* to Cyber Security is facilitating **DISTRUST**.

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Who am I?

My name is Josh Newell, P.Eng.

I’m an instructor in Computer Engineering Technology

I worked in the nuclear industry for about 10 years.

I like cats and gardening, and I don’t like cockroaches.

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Agenda

Intro

Computer Languages

Designing a Communication System
(Arduino Uno)

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Computer Languages

My Learning Outcome:

State the difference between
computer languages
and
natural languages

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Try to think of a word for this image

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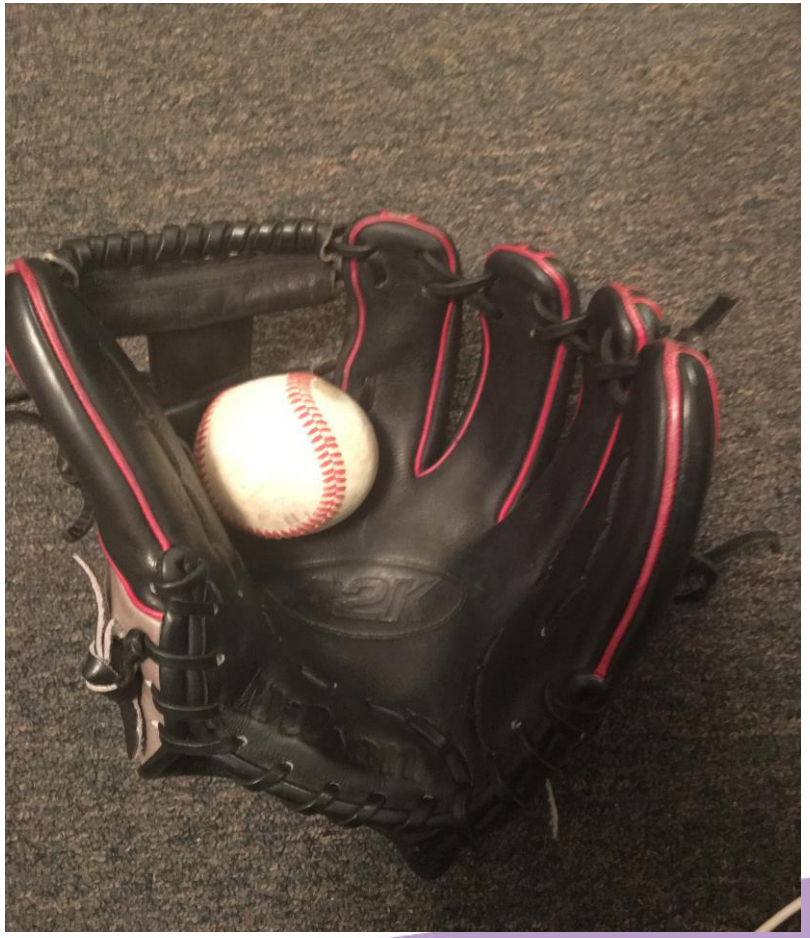
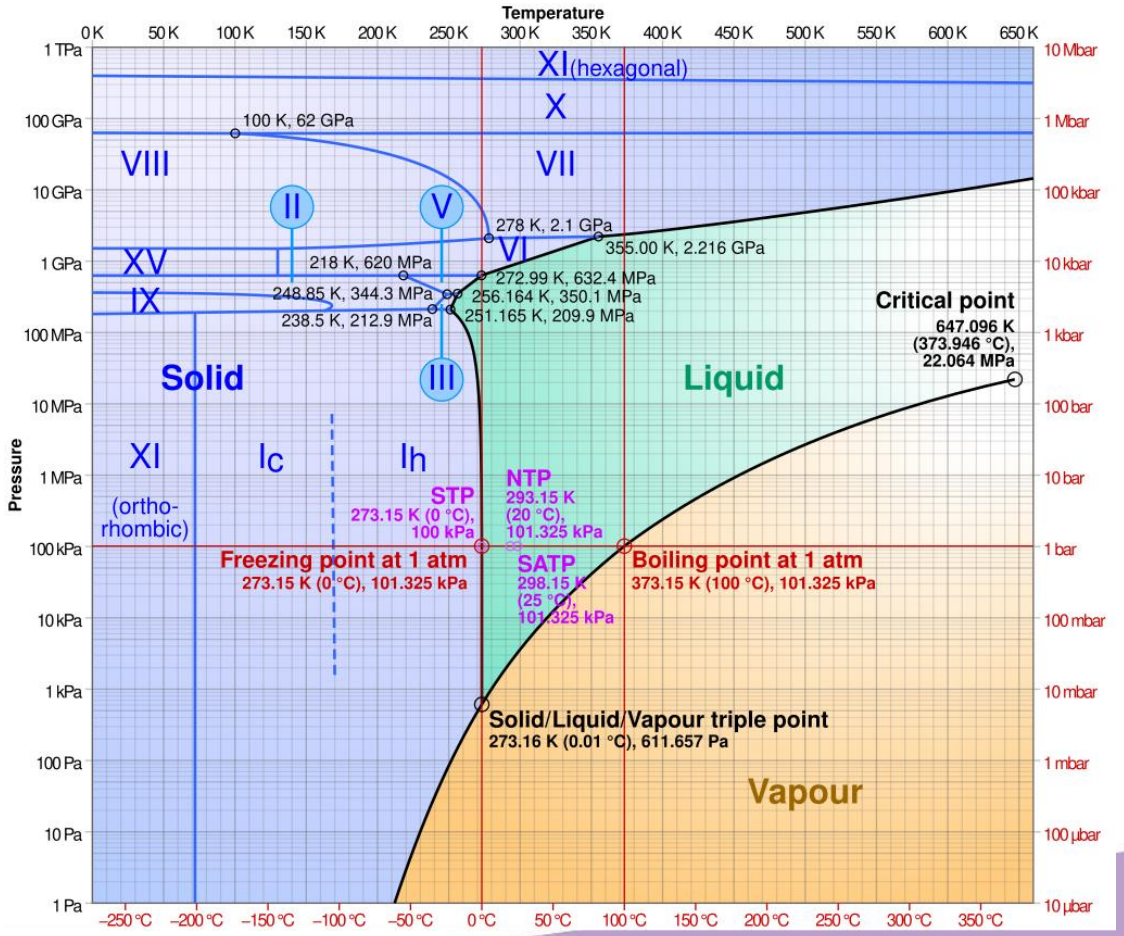
Try to think of a word for this image



Try to think of a word for this image



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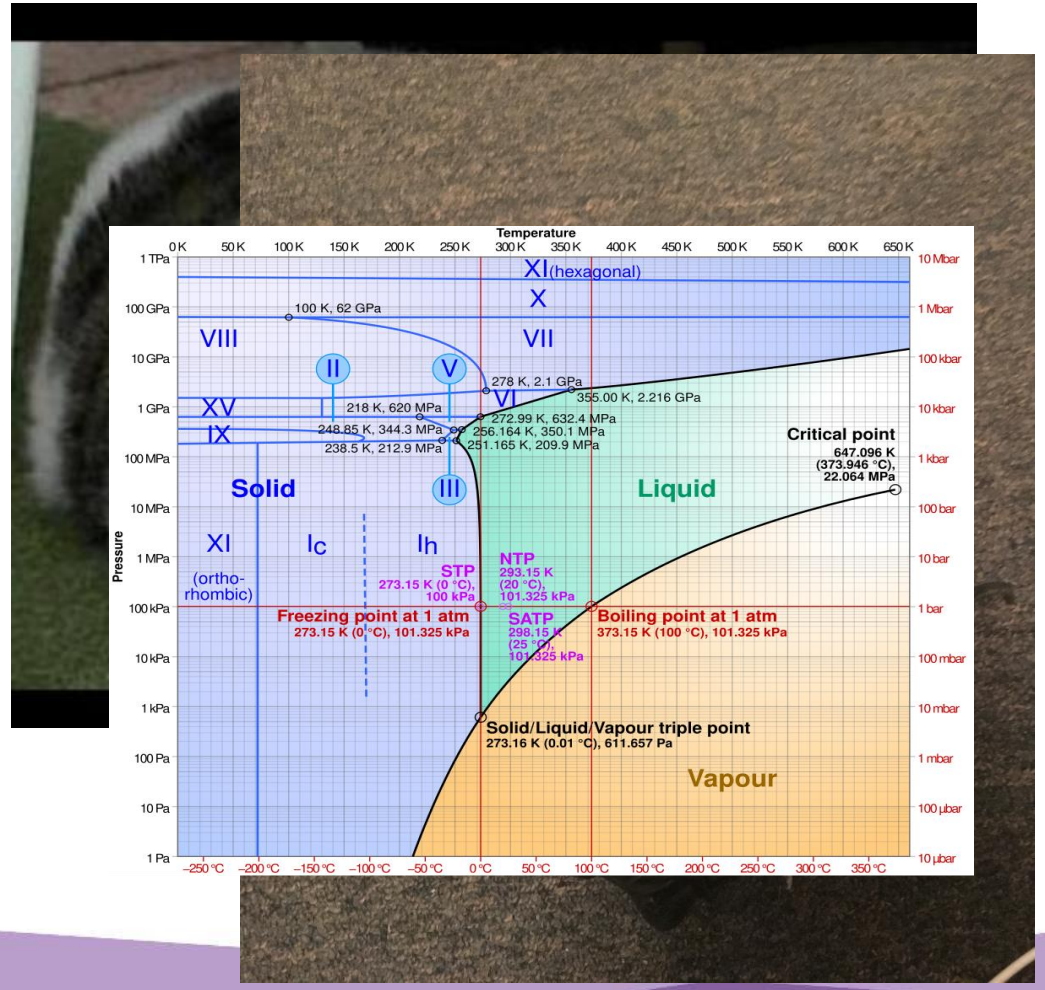
These are my words



- Chonk
- Ball
- Triple Point

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Did everyone think of the same word?

If we all speak English, then **why** didn't we come up with the same interpretation?!

Let's spin it around!

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What do these words mean

- **Cat**
  - *Do you visualize an image?*
    Get a sensation?
    Are you getting the dictionary pop up?!
- **Anti-choice**
  - *Made-up word, but how does the combination of “anti” and “choice” make you feel?*
    If it’s arbitrary, how can it influence you?
- **Sloppy**
  - *What did you see, feel or how did you react?*
    If there’s no context as a subject or object, why does it produce a reaction?

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What do you mean?

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Private Languages

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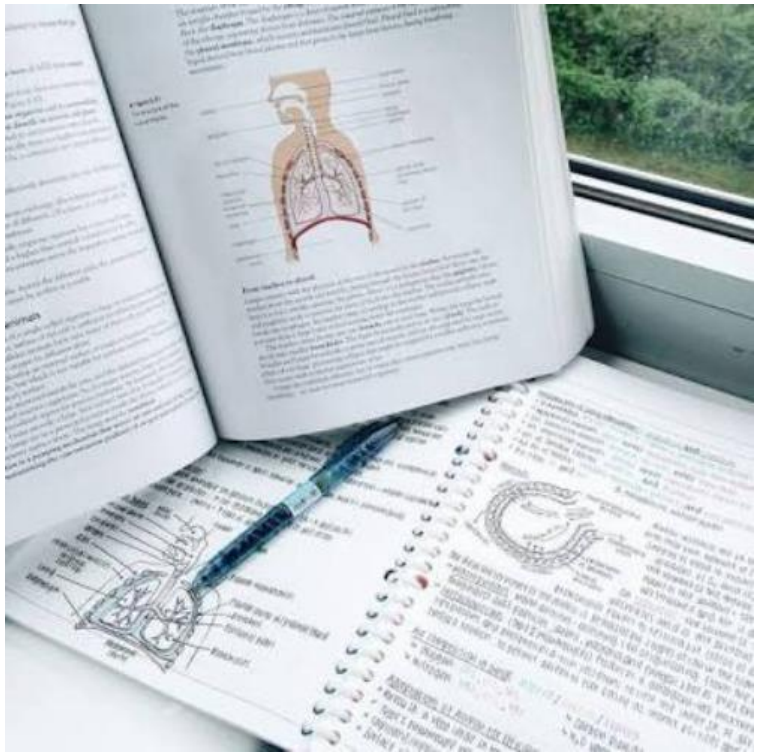
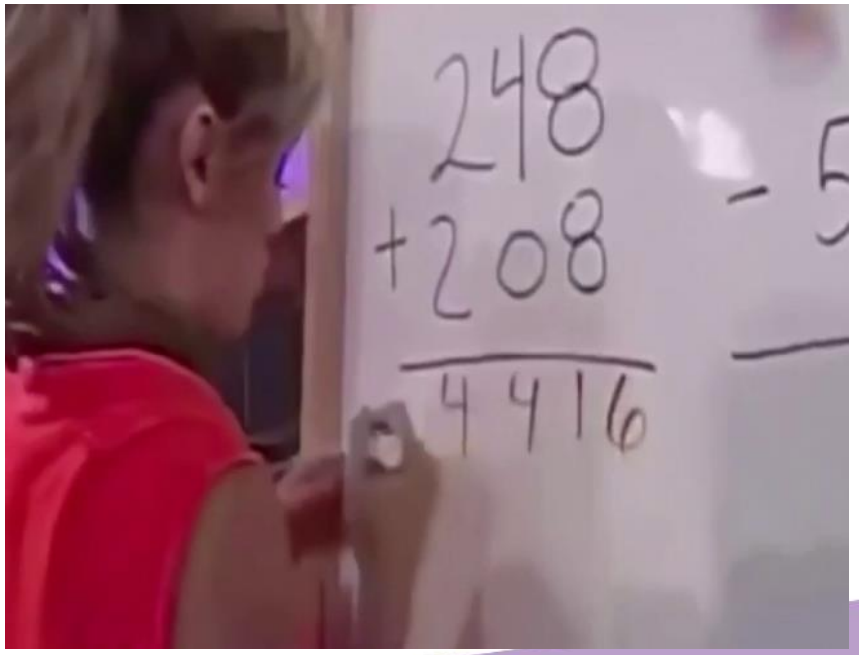
Options for precision?

Controlled Language

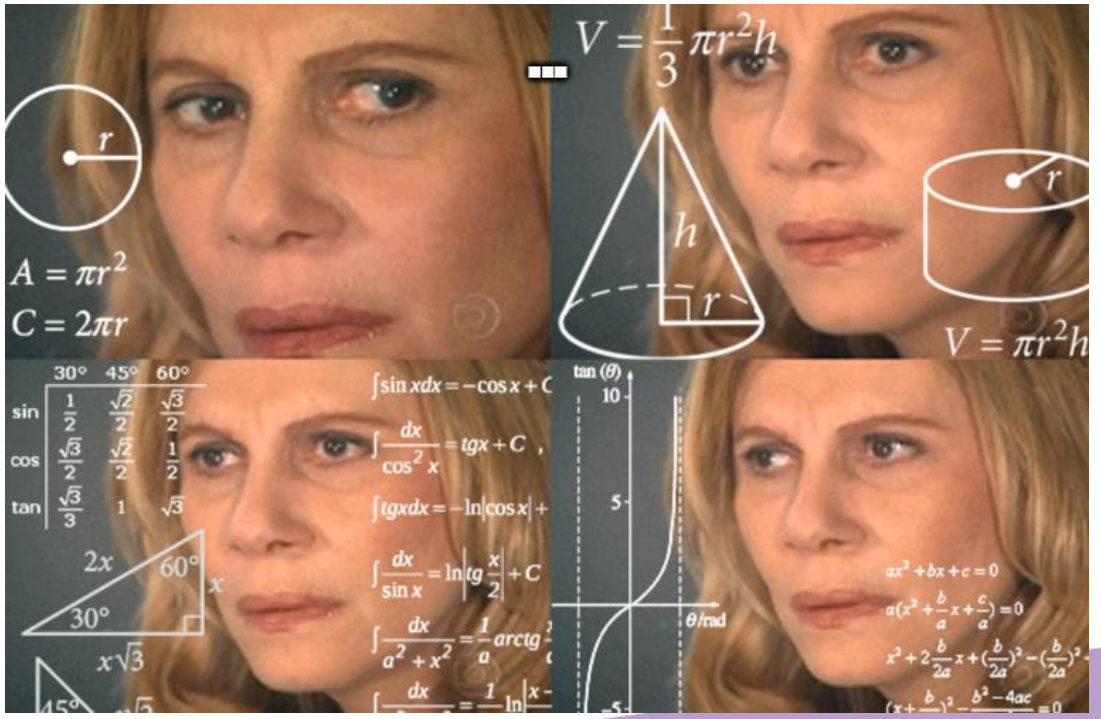


Formal Language



What's a formal language?

Formal languages are mathematical functions!



Examples of formal language?

Computer languages!

Takeaway

The difference between
computer languages
and
natural languages is:

Computer languages are

<u>unambiguous</u> and <u>exact</u>!

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Designing a Digital Communication System

4 Variable Model

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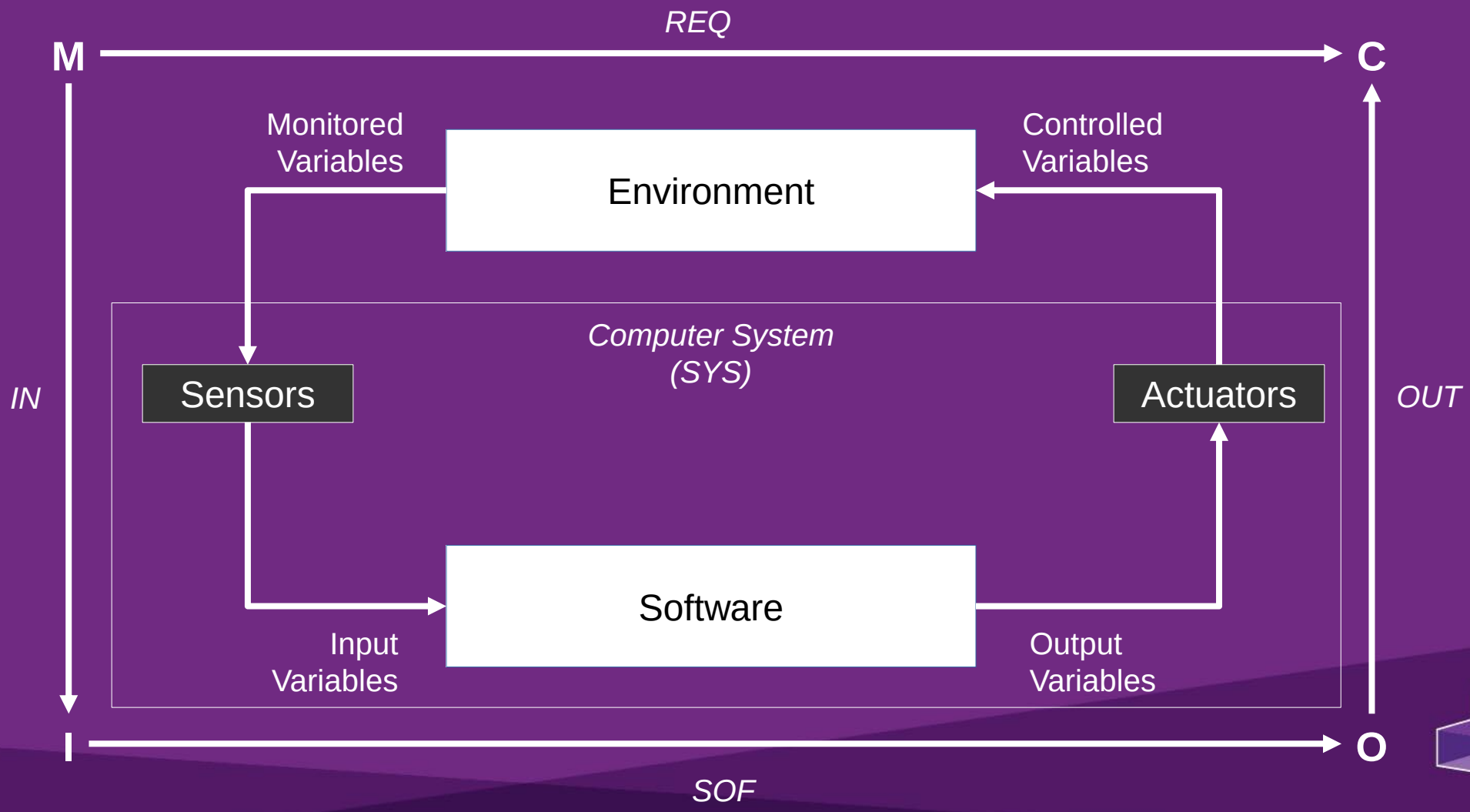
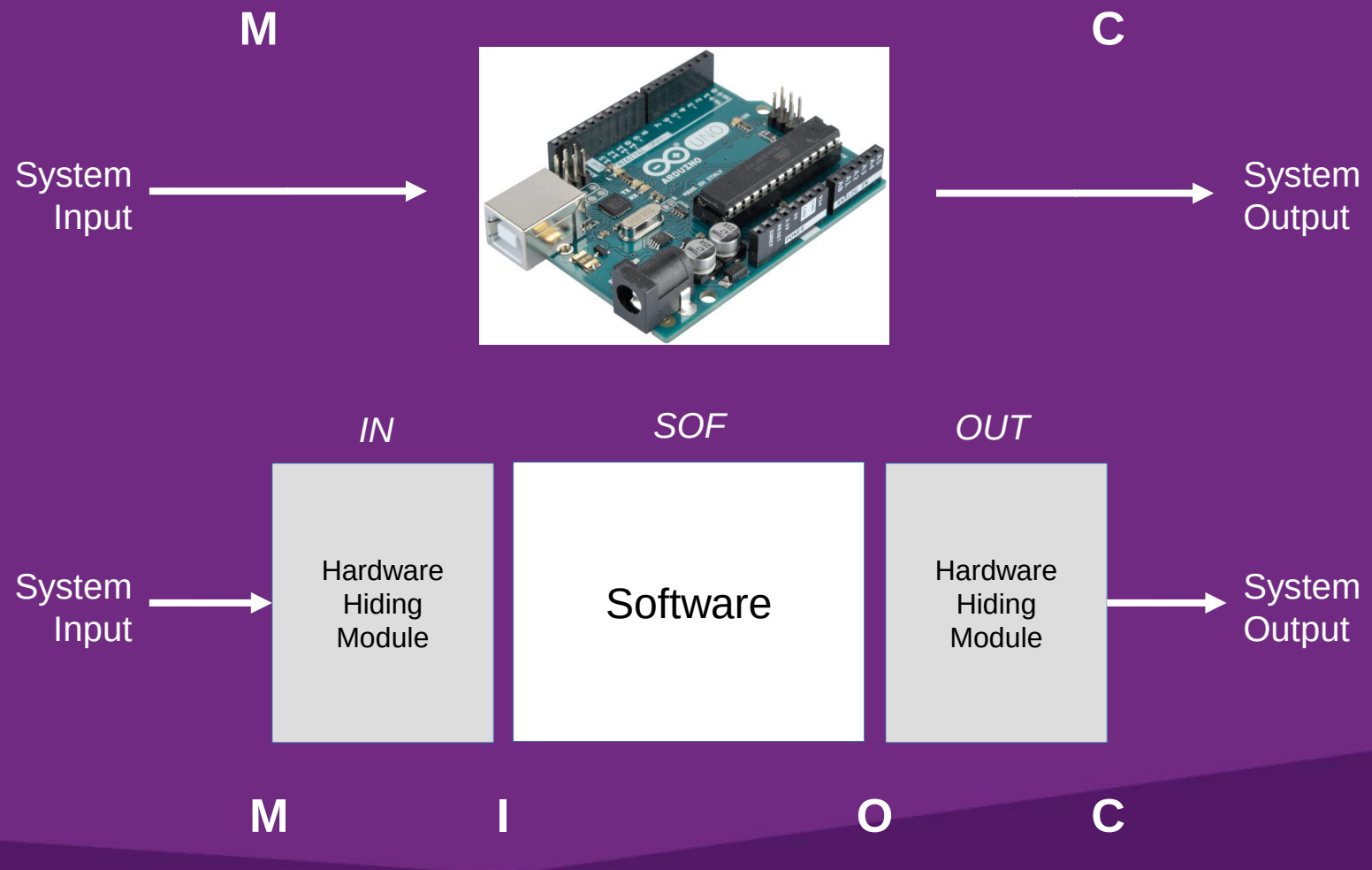
Science of Computer Programming

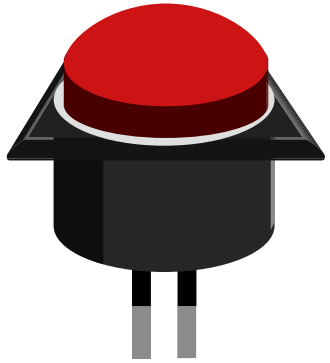


See: [Implementability of requirements in the four-variable model (mcmaster.ca)]

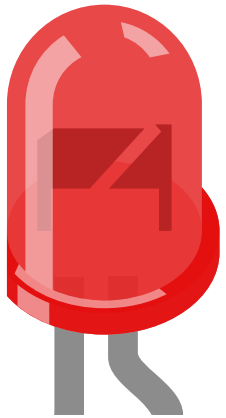
Typical Design



Our Sensors and Actuators



Sensor
(Pushbutton)



Actuator
(LED)

*Images are from fritzing-parts (CC 3.0)

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Activity

Blink LED.

We’re going to blink and LED with Arduino!
(Exercise 1 & 2)

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Activity

Blink LED with a button.

We’re going to connect an Arduino to a pushbutton and blink an LED.
(Exercise 3)

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Activity

Answer questions with light signals.

We’re going to program an Arduino that turns on LEDs to answer questions.
(Exercise 4)

Program 1 button to transmit 4 unique answers.

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Takeaway

VERY close to how computers communicate.

This is one example of sending an exact message through a medium.
But there's multiple varied ways to encode and decode information.

The transmission scheme must always be unambiguous and exact!

Questions?

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